Monday, July 30th

MAKING BIG LENSES.

FOR TWO CENTURIES PARIS HAS HAD A MONOPOLY OF THE ART.

An Interesting Description of the Delicate and Complicated Process, Which, by the Way, Is Surrounded With Much Secrecy.

The making of big lenses has for nearly two centuries been a most jealously guarded monopoly of Paris, the process being surrounded with a good deal of secrecy. The lenses used in the great telescope at the Paris exposition measure 49 inches in diameter, and those of the Yerkes telescope 40 inches, and the story of their manufacture by M. Mantois will give a very good idea of the difficulties the maker of lenses has to contend with.

A crucible of the proper capacity, having been bricked into the oven situated directly over the furnace—the mouth of the crucible only being left exposed—is heated very gradually for about 30 hours or so, when it becomes white hot. It is then ready to receive the glass producing substances. These are thrown in, a small shovelful at a time, and very soon begin to bubble and boil at a tremendous rate.

Were too much thrown in at once the mixture would boil over just like milk and be lost. To fill the crucible completely, therefore, if it be one of some size, takes nearly 24 hours. After it is filled the contents are allowed to go on simmering for another ten hours or so, at the end of which time the crucible resembles a vat of frothy soapsuds.

Up to now it has been mere child's play. The real heating has not begun. The furnace being put in full blast, the temperature in the crucibles rises until it is sometimes as much as 3,300 degrees Fahrenheit. At a temperature such as this the lens maker may consider himself fortunate if the bricks of the oven do not melt and the crucible itself crumble away.

Should no such catastrophe occur, however, the period of intense heating is continued for from 20 to 30 hours, during which time small ladlefuls of the seething liquid are taken out every few minutes and rapidly cooled. They have the form when cold of half glass balls, and each of them is minutely examined with powerful magnifying glasses and in every kind of light to see whether it contains air bells. So long as the smallest bubble is detected the heating has to be continued.

At last, when all the specimens have been found to be perfectly free from air bells, the heat of the furnace is reduced, and the liquid in the crucible is skimmed of all the impurities which have risen like scum and are floating on the surface.

Now begins one of the most difficult parts of the process. This is the stirring and mixing. The substances of which glass is composed are always tending to separate from each other while the mass is cooling. This it is that causes the formation of threads. To counteract this tendency, therefore, a stirring rod of clay, raised itself to white heat in a separate furnace, is introduced into the crucible, over which it is suspended by a system of chains and rods in such a way that it can be moved easily in any direction, just as if it were a huge spoon. The contents of the crucible at this moment are as fluid as water, and the workmen whose task it is to keep the stirring rod in motion have at first only to suffer from the heat. This is so intense that they are obliged to incase their hands and arms in asbestus bags, and even so cannot work for a longer spell than five minutes at a time, when they have to be replaced by others. The perspiration rolls down their foreheads in such streams as to completely deprive them of sight for a time.

As the temperature decreases the contents of the crucible gradually grow thicker and thicker—at first like treacle, then almost of the consistency of dough—the stirring at last being, of course, excessively difficult.

During the whole operation, which lasts on an average from 10 to 15 hours, the testing of specimens for air bells has to go on as before, and if by chance any are found the stirring has to be stopped and the whole boiling process begun over again.

When, however, the stirring is considered to have been continued long enough, the crucible is allowed to cool very rapdly for about five or six hours, until the surface of the contents, being lightly rapped with a piece of iron, gives forth a metallic ring. Were the cooling to be continued as rapidly as it had begun, the glass would be so brittle that at the slightest shock it would fly into 10,000 morsels. The crucible is now, therefore, completely walled up and is not allowed to grow cold for at least a fortnight and sometimes, when large lenses are in question, for six weeks or more.

At last the oven is opened and the glass is found lying within the crucible in lumps of varying size.

It is very seldom that more than half of each of the blocks of glass taken from the crucibles is free from filaments. The thready parts are cut, chipped or ground away and the remaining lumps of pure glass placed in clay molds and put in ovens, the temperature of which is raised to what is comparatively nothing (for glass)—viz, about 1,500 degrees F. The heat, in fact, must be sufficient to soften the glass and make it take the form of the mold. Should it be raised beyond a certain point, so that the glass becomes fluid once more and boils, all is lost.

After it has been molded and cooled, with the same precautions as were adopted in the first instance for the crucible, the lens is roughly polished on the edges, examined with greater care than ever, and, if found free from flaws, is finally handed over to the optician to be polished and made ready for the telescope.

A large lens, it will be clear from what precedes, can only be made from a large block of pure glass, and it is not every day that large enough blocks can be obtained. Lenses, for instance, of a diameter of 49 inches weigh in crown glass when completed over 700 pounds and cost $15,000.—Pearson's Magazine.

Tuesday, July 31st

DAILY TIMES FISH BUREAU.

To-day's Arrivals and Receipts.

Sch. Lizzie M. Stanwood, Georges, 200 bbls. salt mackerel.

Sch. Olympia, Georges, 80 bbls. salt mackerel.

Sch. Procyon, La Have Bank, 40,000 lbs. fresh cod, 1000 lbs. halibut, 100,000 lbs. hake.

Sch. Richard Lester, Bacalieu Bank, 5000 lbs. cod, 3000 lbs. halibut, 6000 lbs. fletched halibut.

Sch. Clara, seining.

Sch. Veteran, seining.

Sch. Two Forty, seining.

Sch. Freedom, seining.

Sch. Edith Emery, Boston, here for ice.

Vessels Sailed.

Sch. Preceptor, halibuting.

Sch. Senator, halibuting.

Sch. Lawrence A. Munroe, Grand Bank.

Sch. George F. Edmunds, seining.

Sch. Harvard, seining.

Sch. Edward A. Perkins, seining.

Sch. Corsair, seining.

Sch. Matthew Keany, Georges.

To-day's Market.

Board of Trade prices, large handline Georges cod, $3.50; medium do., $2.50; large trawl Georges, $3.25; medium, $2.37 1-2; large trawl bank cod, $2.00; medium do., $1.50; large dory handline cod, $2.25; medium do., $1.75; handline cod caught from deck, east of Cape Sable, $3.25 for large and $2.37 1-2 for medium.

Splitting prices, large cod, $1.60; medium do., $1.15; snapper do., 40 cts.; cusk, $1.15; snapper do., 40 cts.; haddock, 65 cts.; hake, 90 cts.; pollock, 60 cts.

Western Bank and Banquereau cod, $1.50 for large, $1.00 for mediums.

Outside sales Bank cod, $2.05 per cwt. for large and $1.60 for medium.

Rips cod, $3.50 per cwt. for large, $2.50 for medium and $1.50 for snappers.

Georges halibut, 9 cts. per lb. right through.

Bank halibut, 9 cts. per lb. for white, 5 cts. for small and 3 cts. for large gray.

Fresh mackerel 4 cents apiece.

Georges salt mackerel, $10 1-2 per bbl. for large and $8 1-2 for medium.

Bay of Fundy salt mackerel, $9.25 per bbl.

Boston.

July 31—Ar., sch. Cavaire, 8000 haddock, 20,000 cod, 4000 hake, 5000 pollock.

Sch. Boyd and Leeds, 10,000 cod, 8000 pollock.

Sch. Mary Cabral, 24,000 haddock, 10,000 cod, 4 swordfish.

Steamer Quartette, 23 swordfish.

Sloop Venus, 7000 haddock, 4000 cod, 3000 pollock.

Sch. Distant Shore, 700 haddock, 200 cod.

Sch. Nickerson, 10,000 cod, 5000 pollock.

Sch. Veteran, dragging, 200 fresh mackerel.

Sch. Henrietta G. Martin, 15,000 haddock, 8000 cod, 1500 pollock.

Sch. Mattakeesett, 8000 haddock, 15,000 cod, 10,000 pollock.

Sch. Fitz A. Oakes, 6000 haddock, 2000 cod.

Sch. Susie Hooper, 260 bbls. salt mackerel.

Haddock $2 25, large cod $2 50, small do. $1.25, pollock 60 cts.

Fishing Fleet Movements.

Wednesday, Aug 1st

DAILY TIMES FISH BUREAU.

To-day's Arrivals and Receipts.

Sch. James A. Garfield, Georges, 280 bbls. salt mackerel.

Sch. Lizzie M. Center, Georges, 330 bbls. salt mackerel.

Sch. William H. Cross, Georges, 210 bbls. salt mackerel.

Sch. Arthur D. Story, Georges, 260 bbls. salt mackerel.

Sch. Lena and Maud, Georges, 360 bbls. salt mackerel.

Sch. Iolanthe, Georges, 73 bbls. salt mackerel.

Sch. Monarch, Georges, 65 bbls. salt mackerel.

Sch. Edith M. Prior, La Have Bank, 130,000 lbs. fresh mixed fish.

Sch Virginia, Grand Bank, 23,000 lbs. cod.

Sch. Mary F. Chisholm, Rips, 35,000 lbs. cod.

Sch. Dido, Grand Bank dory handlining, 130,000 lbs. cod.

Sch. Henrietta G. Martin, Boston.

Sch. Mary A. Brown, seining.